Space Weather Forecast

Issued on Monday, 04 March 2024 at 00:49 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of isolated Moderate flares throughout, and Active geomagnetic intervals at first on day 1 (04 Mar).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity has been Low despite seven sunspots being present on the visible disc. Two moderately large, complex regions in the western hemisphere both underwent slight simplification and decay during the period. The remaining regions are smaller and appear mostly stable. No new Earth-directed Coronal Mass Ejections (CMEs) were observed in imagery.

Solar Wind / Geomagnetic Activity: Solar winds were representative of a background solar wind environment until around 03/0845UTC. From this time solar wind parameters became enhanced due to a CME arrival. Speeds increased then levelled, in the range 330-390km/s. The interplanetary magnetic field was generally weak, but increased sharply following the CME onset, becoming moderate to strong. The north-south component varied weakly prior to the CME, but strengthened significantly thereafter, varying between moderate to strongly positive (northward) and moderate to strongly negative (southward). Geomagnetic activity was Quiet to Unsettled (Kp 1 to 3) until 03/1200 UTC, then became G1-G2/Minor to Moderate storm 03/1200-2100 UTC), with an Active interval (Kp 4) to finish the UTC day.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels with no radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low activity is expected, with a chance of isolated Moderate-class flares.

Solar Wind / Geomagnetic Activity: Ongoing effects from one or more CMEs that arrived earlier on 03 Mar should diminish by early day 1 (04 Mar) with no further CMEs in the current forecast. Otherwise Earth is expected to remain in a background solar wind environment with no significant coronal hole high speed streams expected. Unsettled to Active Geomagnetic activity at first on day 1 (04 Mar), with a very slight chance of a G1/Minor Storm interval from lingering CME effects. Then easing to become generally Quiet from day 2 (05 Mar) onwards.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is likely to persist at background levels, but with a slight chance of rising above the S1/Minor Radiation Storm threshold on day 1 (04 Mar) in response to any notable flares from the large sunspot which rotated beyond the northwest limb during 02 Mar.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	10	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	30	30	30
Very Active	R3 to R5 X	No	5	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	5	5	5
Very Active	≥ S3 *	No	2	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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